

Isolated Liquid Droplet Combustion: Inhibition and Extinction Studies

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Summary

- Introduction of fire suppressants to the ambient environment surrounding a heterogeneous diffusion flame may be an inefficient technique for fire safety in systems without buoyant flows.
- Carbon dioxide substitution for nitrogen diluent leads to significant modifications of the sphero-symmetric burning behavior of isolated n-heptane droplets, partly through increased heat capacity within the gaseous diffusion flame, but mostly because of modifications in spectral radiative coupling in the gas phase.
- Effects of longer time scale phenomena such as sooting and slow gas-phase/droplet convection remain to be determined.
- Similar methodologies can be applied to evaluate the effects and efficacy of chemical inhibitors in the liquid and gas phases.

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